

# INTRODUCING THE EXPANDABLE PDP-10

**digital PDP-10/10**

DIGITAL EQUIPMENT CORPORATION • MAYNARD, MASSACHUSETTS

**digital PDP-10/20**

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**digital PDP-10/30**

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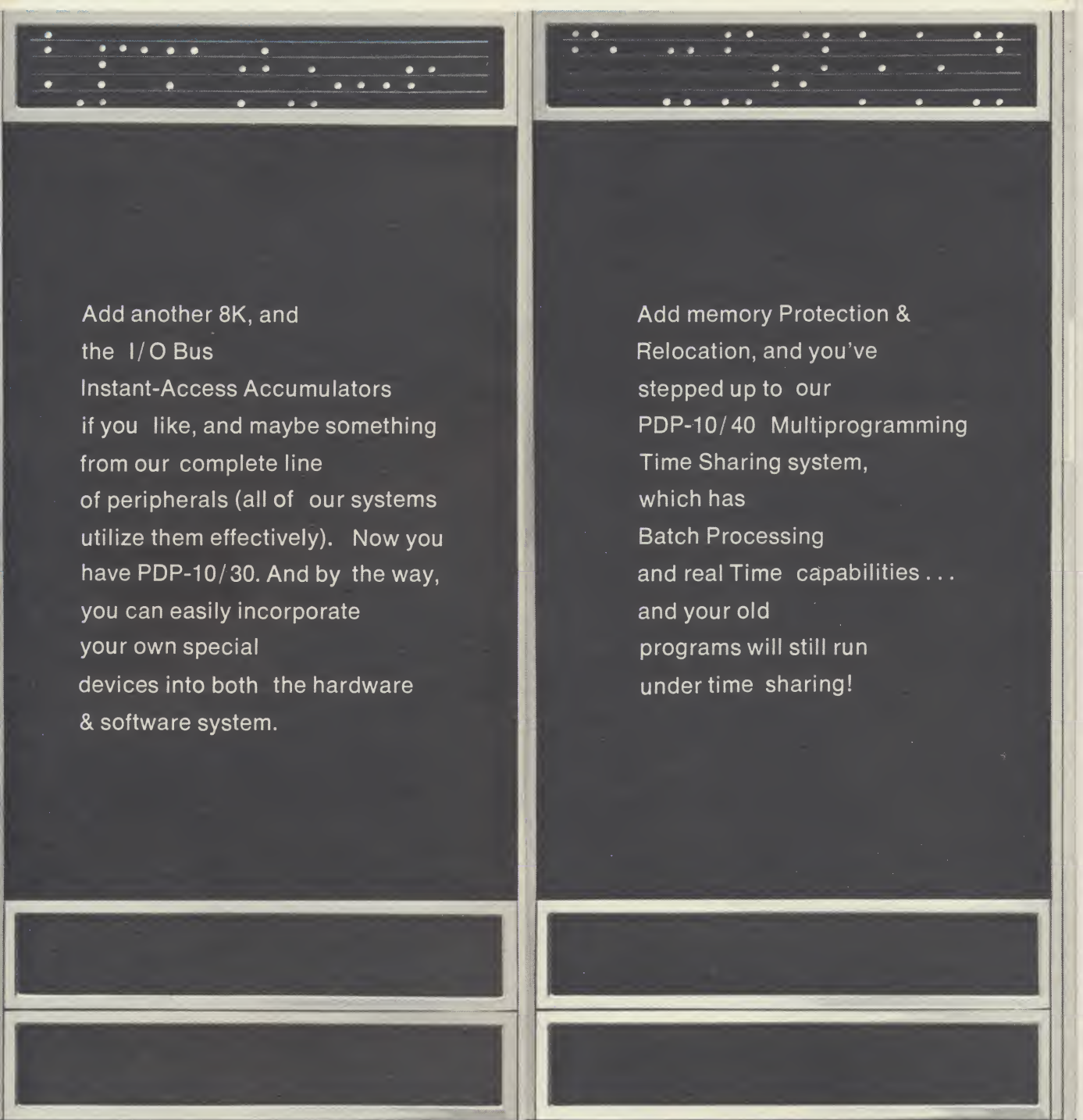
**digital PDP-10/40**

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**digital PDP-10/50**

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# Expandable PDP-1

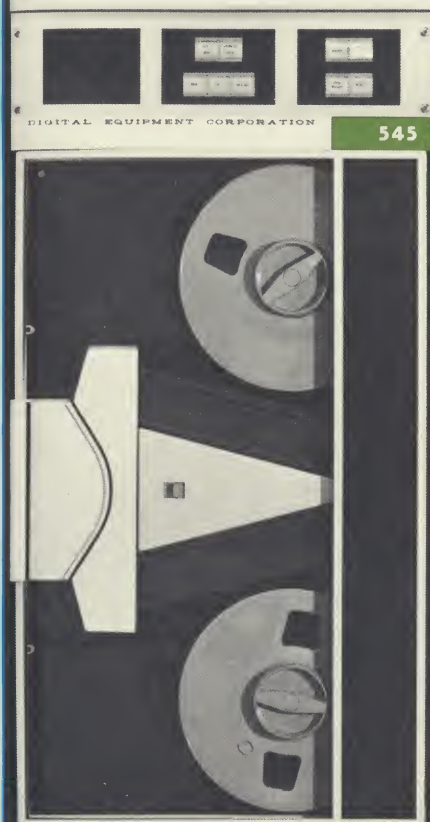


Add another 8K, and  
the I/O Bus  
Instant-Access Accumulators  
if you like, and maybe something  
from our complete line  
of peripherals (all of our systems  
utilize them effectively). Now you  
have PDP-10/30. And by the way,  
you can easily incorporate  
your own special  
devices into both the hardware  
& software system.

Add memory Protection &  
Relocation, and you've  
stepped up to our  
PDP-10/40 Multiprogramming  
Time Sharing system,  
which has  
Batch Processing  
and real Time capabilities...  
and your old  
programs will still run  
under time sharing!



# 10's



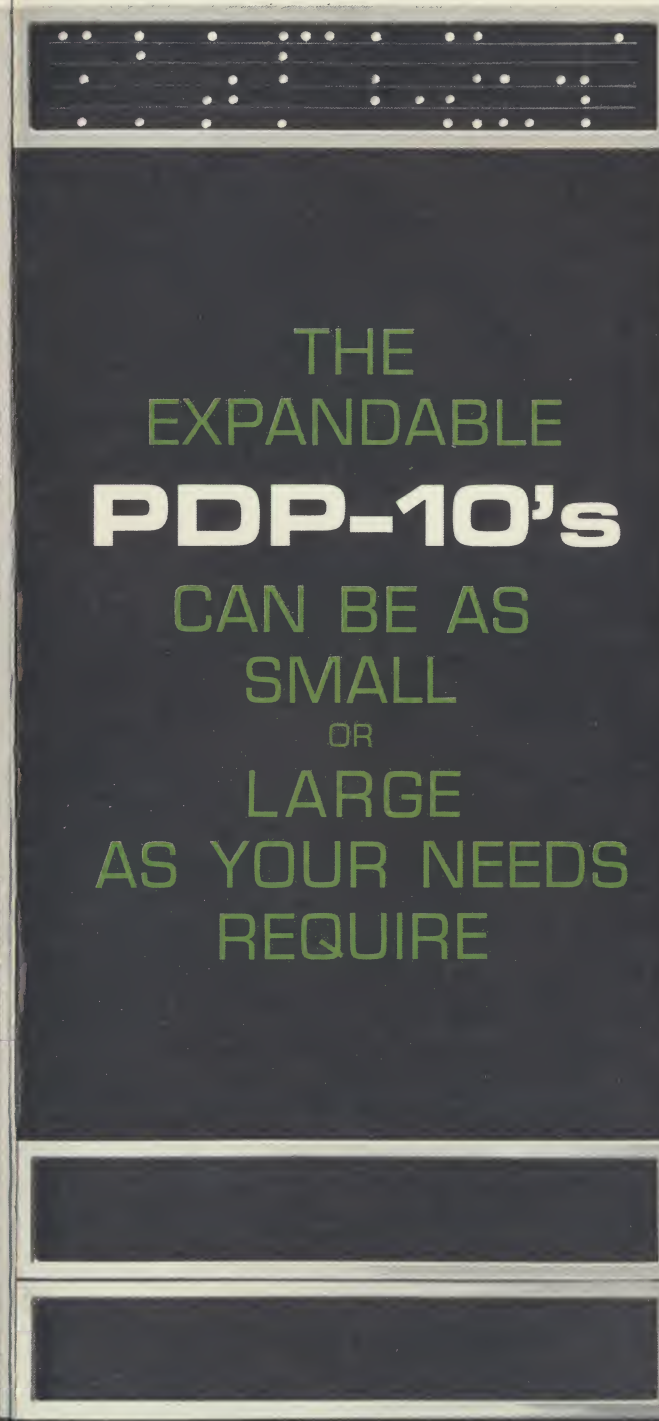
Add our Disc-File,  
Magnetic Tapes  
and a Selector  
Channel,  
plug in 16K  
more core  
memory,



and you  
have our  
PDP-10/50  
Multiprogramming/  
Swapping  
Time-Sharing System.



If you want to multi-  
process then add one of  
our other computers  
such as PDP-8. This  
controls teletypes and  
services specialized I/O  
such as A-D converters,  
displays, etc.



THE  
EXPANDABLE  
**PDP-10's**  
CAN BE AS  
SMALL  
OR  
LARGE  
AS YOUR NEEDS  
REQUIRE

# The

Start with PDP-10/20 which includes  
8K of core memory, 2 DEC Tapes  
and:

- Monitor 10/20
- Fortran IV Compiler
- Macro Assembler
- Context Editor
- Symbolic Debugging Program
- I/O Controller
- Peripheral Interchange Program
- Desk Calculator
- Library Programs





# PDP-10 HARDWARE CHARACTERISTICS

## GENERAL

General purpose, stored program, binary digital computer  
Parallel processing  
Asynchronous operation  
36 bit word  
16 general purpose registers  
High speed multiplexor channels  
Programmed-priority interrupt system  
7 fully-nested interrupt levels  
Flexible I/O bus structure  
Easily interfaced to special devices  
Executive and user modes of operation  
Functional operator console  
High-reliability Flip-Chip logic

## PROCESSOR

16 accumulators  
15 index registers  
Multilevel indirect addressing with indexing  
Floating point hardware to 8 decimal digits  
Immediate mode addressing of operands  
64 programmed operators  
Highly symmetric, logically complete order code  
365 powerful instructions  
Easy to learn, modular mnemonics  
Data Manipulation by:  
    36 bit word, half word, double word  
    Bytes of *any* size (automatic sequential access)  
    Memory blocks of *any* size  
Typical Arithmetic Instruction times:  
    Move to accumulator – 1.9  $\mu$ sec  
    Fixed point 36 bit add – 2.1  $\mu$ sec

\*Instruction times assume one instruction fetch and one operand fetch from overlapped 1.0  $\mu$ sec core memories and includes Fast Accumulators.

Floating point times are based upon average data.

Fixed point 72 bit multiply – 9.1  $\mu$ sec  
Floating point add – 5.1  $\mu$ sec  
Floating point multiply – 8.8  $\mu$ sec  
Jump – 1.0  $\mu$ sec

All 16 Boolean operations, each in four modes  
8 arithmetic comparison instructions, in eight modes  
16 bit test/modify instructions, in four modes  
Four kinds of subroutine call and return instructions  
Push Down Stack Operations for:  
    Data manipulation  
    Inter-program transfer  
    Re-entrant code

6 Arithmetic flags facilitate double precision  
Programmable Trapping upon:  
    Operator selected memory reference conditions  
    Real time increment elapse  
    Five distinguishable arithmetic overflow conditions  
    Non-existent or illegal memory reference  
    Push down list overflow  
    Memory parity error  
    Power failure detection

## STORAGE

262,144 directly addressable 36 bit words  
1.0 microsecond memory cycle time  
Asynchronous operation with respect to processors  
Nanosecond access times  
Automatic parity checking  
Memory protection  
Dynamic program relocation  
Memory Bus Structure permitting:  
    Multiprocessing  
    Memory modules of different speeds  
    Program/data overlap  
    Interleaving on low order bit(s)

16 instant access registers permit high speed:  
    Indexing  
    Accumulator fetch and store  
    Program execution

# PDP-10 SOFTWARE CHARACTERISTICS

## FIVE COMPLETE SOFTWARE SYSTEMS

All systems achieve total modularity through dynamic core utilization and complete device independence.

All are truly upward compatible at both source and relocatable binary levels.

All expand gracefully to any hardware configuration.

All perform identical buffered input-output overlapped with computation for all devices.

*Monitors 10/10, 10/20 & 10/30:* Single-user monitors for 8K paper tape, 8K DECtape and larger systems respectively.

- I/O Controller
- Run time selection of I/O devices
- Job-to-job transition
- Job save and restore features
- Memory dumps
- System builder permitting creation of custom tailored monitor and I/O systems.

*Monitor 10/40:* Field tested and proven multiprogramming time sharing system with powerful command structure incorporating all of the features of monitor 10/30 with concurrent real time processing, batch processing, and time sharing.



Monitor 10/50: Full range disc swapping multiprogramming time sharing system incorporating all of the features of monitor 10/40 with greatly extended capacity.

Complete utility software including:

- FORTRAN IV – ASA standard single pass compiler with highly optimized object code fully exploiting PDP-10's powerful instruction set.
- MACRO ASSEMBLER – Flexible assembly language with sophisticated macro facilities and many special data generating, conditional assembly, listing and control pseudo-operations.
- TECO – Powerful context editor with sophisticated macro facilities, and iterative string search, match, and substitution operations.
- DDT – Famous on line symbolic debugging aid with more than 50 commands, permitting dynamic interaction with running programs.
- LINKING LOADER – Loads and links independently assemble or compiled relocatable or absolute binary programs. Twenty special options including automatic library search and chaining facilities.
- PERIPHERAL INTERCHANGE – Transfers alphanumeric or binary data from or to any I/O device with optional editing, sequencing, merging, and syntax checking features.
- FORTRAN IV OPERATING SYSTEM – More than 100 library routines including double precision and complex functions. Dump and chain facilities. Dynamic assignment of I/O devices.
- MANY OTHERS – Including a LISP interpreter, a powerful desk calculator with macro facilities, and a library editing and updating system.

**digital**

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Elsewhere: AC617-897-8821  
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